

AMENDMENTS TO THE CLAIMS

The listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims

1. (Currently Amended) A monitor device for displaying a front scene of a moving body with an image of an actual or imaginary converging point of a lane of a running path for the moving body being at a center of an image frame, comprising:

an image forming section for forming a two dimensional image of the front scene of the moving body with the image of the actual or imaginary converging point of the lane of the running path for the moving body being at the center of the image frame on a image plane, wherein the image forming section includes a distortion lens having a characteristic of forming an image, with a height of the image being larger in a central area and smaller in a peripheral area so as to allow the central area of the image to have a high resolution;

an image sensor for photo-electrically converting the two dimensional image into electric image data;

a speed sensor for detecting a running speed of the moving body;
a zoom ratio determining section for determining a zoom ratio in accordance with the detected running speed;

an image area selecting section for processing the image data to select, in accordance with the determined zoom ratio, the central area of the image formed by the distortion lens;

an image enlarging section for processing the image data processed by the image area selecting section to enlarge the image of the selected area with the zoom ratio determined by the zoom ratio determining section; and
a display for displaying the image of the area enlarged by the image enlarging section.

2. (Cancelled)

3. (Currently Amended) A monitor device according to claim [[2]] 1, the image forming section is arranged to form an image of the front scene, with the image of an actual or imaginary converging point of the lane of the running path for the moving body being at the center of a frame of the formed image.

4. (Currently Amended) A monitor device according to claim [[2]] 1 further comprising a lens characteristics control section for controlling the characteristics of the distortion lens such that the height of the image becomes larger as the speed of the moving body increases.

5. (Original) monitor device according to claim 4 wherein the lens characteristics control section controls the characteristics of the distortion lens such that the ratio of changing of the height of image per unit change of angle of view is larger when the speed of the moving body is high.

6. (Currently Amended) A monitor device according to claim [[2]] 1 further comprising an image data processing section for processing the image data to correct distortion of the image taken by the distortion lens.

7. (Original) A monitor device according to claim 1 further comprising a housing incorporating the image forming section and the image sensor; a tilting acceleration sensor for detecting acceleration in the movement of the housing in the tilting direction; a tilting drive calculating section for calculating amount of driving of the housing to offset the movement of the housing; and a driving section for driving the housing in accordance with the amount of driving calculated by the tilting drive calculating section.

8. (Original) A monitor device according to claim 1 further comprising a housing incorporating the image forming section and the image sensor; a panning acceleration sensor for detecting acceleration in the movement of the housing in the panning direction; a panning drive calculating section for calculating amount of driving of the housing to offset the movement of the housing; and a driving section for driving the housing in accordance with the amount of driving calculated by the panning drive calculating section.

9. (Original) A monitor device according to claim 1, wherein the speed sensor includes a speed classifying section for determining which of a plurality of speed ranges a detected speed belongs, the zoom ratio determining section determines the zoom ratio in accordance with the determined range, the image area selecting section selects area of the image in accordance with the determined range.

10. (Original) A monitor device according to claim 9, wherein the speed classifying section determines which of a first and a second speed ranges the detected speed belongs, the speed of the second range being higher than that of the first range; the zoom ratio determining section determines a first zoom ratio when the detected speed is within the first range, and determines a second zoom ratio when the detected speed is within the second range, the second zoom ratio being larger than the first zoom ratio; and the image area selecting section processes the image data to select a first area of the two dimensional image when the first zoom ratio is determined, and select a second area of the two dimensional image when the second zoom ratio is determined, the second area being smaller than the first area.

11. (Original) A monitor device according to claim 1 further comprising a resizing section for processing the image data of the selected area to enlarge the image to be displayed in entire area of a display screen of the display.

12. (Original) A monitor device according to claim 1, further comprising an object detecting unit for detecting whether the image data include a data of an image of an unexpected object, and a speed control section for controlling the moving body in accordance with the detection by the object detecting unit.

13. (Original) A monitor device according to claim 12, wherein the speed control section controls the moving body to reduce the speed of the moving body when the unexpected object is detected in the image data.

14. (Original) A monitor device according to claim 1, the image forming section is arranged to form an image of the front scene, with the image of an actual or imaginary converging point of the lane of the running path for the moving body being at the center of a frame of the formed image.

15. (Original) A monitor device according to claim 13, wherein the image enlarging section for processes the image data processed by the image area selecting section to enlarge the image of the selected area radially towards its periphery with its central image remaining at the center.

16. (Currently Amended) A monitor device for displaying a front scene of a moving body, comprising:

an image forming section for forming a two dimensional image of the front scene on a image plane, wherein the image forming section includes a distortion lens having a characteristic of forming an image, with a height of the image being larger in a central area and smaller in a peripheral area so as to allow the central area of the image to have a high resolution;

an image sensor for photo-electrically converting the two dimensional image into electric image data;

a speed sensor for detecting a running speed of the moving body;

a zoom ratio determining section for determining a zoom ratio in accordance with the detected running speed;

an image sensor driving section for driving the image sensor to change the photo-electrically converted area of the two dimensional image in accordance with the determined

zoom ratio so as to make the image sensor output image data in accordance with the determined zoom ratio;

an image enlarging section for processing the image data to enlarge the image of the converted area with the zoom ratio determined by the zoom ratio determining section, wherein photoelectric conversion data (image data) is read out only for the area determined in accordance with the zoom ratio in the effective imaging area in the image sensor, such that only the predetermined area is photoelectrically converted and only the obtained area is read out; and a display for displaying the image of the area enlarged by the image enlarging section.

17. (Cancelled)

18. (Original) A monitor device according to claim 12 further comprising a lens characteristics control section for controlling the characteristics of the distortion lens such that the height of the image becomes larger as the speed of the moving body increases.

19. (Original) A monitor device according to claim 11, wherein the speed sensor includes a speed classifying section for determining which of a plurality of speed ranges a detected speed belongs, the zoom ratio determining section determines the zoom ratio in accordance with the determined range, the image area selecting section selects area of the image in accordance with the determined range, and the monitor device further comprising a resizing section for processing the image data of the selected area to enlarge the image to be displayed in entire area of a display screen of the display.

20. (Original) A monitor device according to claim 11, further comprising an object detecting unit for detecting whether the image data include a data of an image of an unexpected object, and a speed control section for controlling the moving body in accordance with the detection by the object detecting unit.